B. S. IN BIOLOGY: MICROBIOLOGY CONCENTRATION

Fall 2021 – Spring 2022

I. ACADEMIC FOUNDATIONS & DEGREE REQUIREMENTS

Requirement	*Course*	*Credits*	*Term*	*Year*	*Grade*
First Year Experience	FYE 100	4	_____	_____	____
Effective Writing I	WRT 120	3	_____	_____	____
Effective Writing II	WRT 2__♠	3	_____	_____	____
Mathematics: Statistics	MAT 121+ or 125+	3	_____	_____	____
Interdisciplinary ("I")	_____	3	_____	_____	____
Diverse Communities ("J")	_____♥	3	_____	_____	____
Ethics ("ET")	_____♥	3	_____	_____	____

Writing Emphasis ("W") *Nine credits♣, integrated across General Education & Major courses.*

	BIO 211	___	_____	_____	____
	_____	___	_____	_____	____
One at 300/400-level:	_____	___	_____	_____	____

Speaking Emphasis ("SE") *Nine credits♣, integrated across General Education & Major courses.*

	_____	___	_____	_____	____
	_____	___	_____	_____	____
One at 300/400-level:	BIO 490	___	_____	_____	____

II. GENERAL EDUCATION DISTRIBUTIVE REQUIREMENTS

- *Courses must be selected from the approved General Education list (see the catalog).*
- *Interdisciplinary ("I") courses cannot also be a General Education distributive course.*
- *Biology majors fulfill their science requirements with CHE 103 and PHY 130/170.*
- *Distributive requirements can be simultaneously satisfied with other degree requirements, see some examples♦.*

A. Humanities (6 credits): E.g., Literature (LIT/CLS), History (HIS), Philosophy (PHI)

Courses must be selected from two different subject areas.

_____	3	_____	_____	____
_____	3	_____	_____	____

B. **Behavioral and Social Sciences** (6 credits): E.g., Psychology (PSY), Sociology (SOC), Anthropology (ANT), Political Science (PSC), Geography (GEO), Economics (ECO)

Courses must be selected from two different subject areas.
Note: Students taking the MCAT should take PSY 100 and SOC 100.

_____	3	_____	_____	____
_____	3	_____	_____	____

C. **Arts** (3 credits): E.g., Art (ART), Art History (ARH), Dance (DAN), Film (FLM), Music (MHL, MTC), Theater (THA)

_____	3	_____	_____	____

III. DIRECTED ELECTIVES – 17 credits (as many as needed to reach 120 total credits)

_____	___	_____	_____	____	
_____	___	_____	_____	____	
_____	___	_____	_____	____	
_____	___	_____	_____	____	
_____	___	_____	_____	____	
_____	___	_____	_____	____	

IV. SUPPORTING COURSES (28 credits)

Calculus +*	MAT __	3	_____	_____	____
General Chemistry I	CHE 103	3	_____	_____	____
General Chemistry I Lab	CRL 103	1	_____	_____	____
General Chemistry II	CHE 104	3	_____	_____	____
General Chemistry II Lab	CRL 104	1	_____	_____	____
Organic Chemistry I	CHE 231	4	_____	_____	____
Organic Chemistry I Lab	CRL 231	2	_____	_____	____
Organic Chemistry II	CHE 232	3	_____	_____	____
General Physics I **	PHY 130	4	_____	_____	____
General Physics II	PHY 140	4	_____	_____	____

V. BIOLOGY COURSES (42 credits) -- GPA must be 2.0 or higher to graduate.

A. *Required Core Courses* (19 credits)

General Biology I ***	BIO 110	4	_____	_____	____
General Biology II ***	BIO 111	4	_____	_____	____
Genetics ***	BIO 210	3	_____	_____	____
Genetics Lab ***	BIO 210L	1	_____	_____	____
Cell Biology ***	BIO 211	4	_____	_____	____
Seminar or Internship or	BIO 490/409/491				
Independent Study***△		3	_____	_____	____

B. *Other Required Courses* (15 credits)

General Microbiology ***	BIO 214	4	_____	_____	____
General Ecology ***	BIO 270	3	_____	_____	____
Microbial Physiology***	BIO 464	4	_____	_____	____
Immunology***	BIO 465	4	_____	_____	____

C. *Biology Electives* (8 credits) to be chosen from the following:

Pathogenic Microbiology	BIO 314	4	_____	_____	____
Molecular Biology Techniques	BIO 333	2	_____	_____	____
Microbial Genetics ****	BIO 334	4	_____	_____	____
Applied & Industrial Microbiology	BIO 414	3	_____	_____	____
Molecular Genetics ****	BIO 431	3	_____	_____	____
Parasitology	BIO 452	3	_____	_____	____
Mycology	BIO 454	3	_____	_____	____
Virology	BIO 456	3	_____	_____	____
Microbial Ecology	BIO 474	4	_____	_____	____
Epidemiology	BIO 484	3	_____	_____	____
Light Microscopy	BIO 480	3	_____	_____	____

Notes and Requirements

Total degree program: 120 credits.

♠ The second (200-level) WRT course is chosen from WRT 200, 204, 205, 206, 208, or 220.

♥ The Diverse Communities ("J") course and the Ethics ("ET") courses can be satisfied through another requirement (e.g., Interdisciplinary or Distributive) as long as the course carries the appropriate attribute(s). *Note*: Credits are not duplicated such that if a course satisfies two requirements, those credits must be made up via directed electives (the minimum total credits for a B.S. degree is 120).

♣ All students must take at least 9 credits of Writing Emphasis courses and 9 credits of Speaking Emphasis courses. Students who enter WCU with 40-70 transfer credits only need 6 credits of each; students who enter with >70 transfer credits only need 3 credits of each. **All students must take at least 3 credits of Writing Emphasis and 3 credits of Speaking Emphasis at the 300-400 level.**

♦ Students should think about how requirements can be simultaneously satisfied. As examples: LNC 110 is a Humanities distributive that satisfies the Ethics requirement; PHI 180 is a Humanities distributive that satisfies the Diverse Communities & Ethics requirements; LIT 165 is a Humanities distributive that is also Writing Emphasis; PSC 101 is a Behavioral & Social Science distributive that satisfies the Diverse Communities requirement.

+ All student will need to complete the Math Placement Exam before they can enroll in MAT courses. For information, please visit the link below. Please direct any questions to mathexam@wcupa.edu.
https://www.wcupa.edu/sciences-mathematics/mathematics/mathematicsPlacement.aspx

* The Biology department recommends MAT 145 (Calculus for the Life Sciences; 3 credits) or MAT 161 (Calculus I; 4 credits). MAT 143 (Brief Calculus; 3 credits) is also acceptable. You must meet the necessary pre-requisites or obtain a minimum score on the Math Placement Exam to enroll in a calculus class. Visit the Math Department website to take the exam. If you receive a score of 3 or lower on the placement exam, you must take MAT 115 (Algebra, Functions, and Trigonometry) or MAT 131 (Precalculus) as preparation for Calculus (MAT 143 or MAT 145). If a student scores a 2 or lower, they will need to take MAT Q30 before they can enroll in MAT 115 or MAT 131. Students can repeat the mathematics assessment to improve their score. If you receive a score of 4 or above, you can enroll directly into MAT 143 or MAT 145. You must score a 5 to enroll into MAT 161 or take the pre-requisite of MAT 131.

** The recommended Physics sequence is PHY 130 & PHY 140. Students may substitute the PHY 170 & PHY 180 sequence, but PHY 130 may not be used as a prerequisite for PHY 180 and PHY 170 may not be used as a prerequisite for PHY 140.

*** Course must be passed with a "C-" or better.

**** Only one of BIO 334 (Microbial Genetics) or BIO 431 (Molecular Genetics) can be used as an elective.

△ Students using BIO 409 to fill this requirement must be aware that using three credits in a required Biology course (section V - A) will not also count as three credits towards a Biology elective (section V - B). Check with your academic advisor if you are unsure of credit usage. A maximum of 8 combined credits from BIO 409 & 491 may be applied to the total BIO elective credits.

Suggested Sequence for B.S. Biology Majors

Microbiology Concentration

Fall 2021 – Spring 2022

	Semester #1 (15 credits)		**Semester #2 (17 credits)**
____	FYE 100 (4)	____	WRT 2___ (3)
____	WRT 120 (3)	____	BIO 111 (SE) (4)
____	BIO 110 (4)	____	CHE 104 (3) & CRL 104 (1)
____	CHE 103 (3) & CRL 103 (1)	____	Gen Ed Distributive: Behavioral & Social Science (3)
		____	MAT 125 or MAT 121 (3)
	Semester #3 (16 credits)		**Semester #4 (17-18 credits)**
____	BIO 210 (3) & BIO 210L (1)	____	BIO 211 (W) (4)
____	CHE 231 (4) & CRL 231 (2)	____	BIO 214 (4)
____	Gen Ed Distributive: Humanities & Ethics Course (ET) (3)	____	CHE 232 (3)
		____	MAT 145 (3) or MAT 143 (3) /161 (4)
____	Gen Ed Distributive: Arts (3)	____	Gen Ed Distributive: Behavioral & Social Science (3)
	Semester #5 (16 credits)		**Semester #6 (13 credits)**
____	BIO 270 (3)	____	BIO Elective (3)
____	PHY 130 (4)	____	PHY 140 (4)
____	Diverse Communities Course (J) (3)	____	Interdisciplinary Course (I) (3)
____	Directed Elective (W) (3)	____	Speaking Emphasis Course (SE) (3)
____	Directed Elective (3)		
	Semester #7 (13 credits)		**Semester #8 (13-16 credits)**
____	BIO 465 (4)	____	BIO 464 (4)
____	BIO Elective (3)	____	BIO Elective (3)
____	Upper-level Directed Elective (W) (3)	____	Directed Elective (3) (if needed)
____	Gen Ed Distributive: Humanities (3)	____	Directed Elective (3) (if needed)
		____	BIO 490/409/491 (SE) (3)

All required 200 level Biology courses should be completed by the end of Semester #5.

Students should take Statistics (MAT 121 or 125) in the first year.

All students must take at least 9 credits of Writing Emphasis courses and 9 credits of Speaking Emphasis courses. Students who enter WCU with 40-70 transfer credits only need 6 credits of each; students who enter with >70 transfer credits only need 3 credits of each. **All students must take at least 3 credits of Writing Emphasis and 3 credits of Speaking Emphasis at the 300-400 level.**